The Theory of Unconventional Monetary Policy

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SNB Research Conference

23-24 September 2016
What This Paper is About

- "The problem with QE is it works in practice but it doesn’t work in theory"
- We explain why QE works in theory
What Should (Can) Central Banks Do?

Three views

- **Hayek**
  - Hard to improve on markets
  - Hayek supported the gold standard
  - Central Banks mess things up

- **Arrow Debreu**
  - Arrow Debreu
  - Every PO can be decentralized as CE
  - Central Banks are irrelevant

- **Keynes (Channeled through MIT)**
  - Markets don’t work
  - Labor Demand not equal to Labor Supply
  - Interpreted (wrongly in my view by Samuelson) as disequilibrium
  - Central Banks counteract sticky prices
Our View of What Central Banks Should (Can) Do

A fourth view

- We Use Equilibrium Theory.
  - In other work Farmer has used a very different equilibrium concept...
  - ... where there may be many steady state unemployment rates
  - In our paper we use equilibrium in the usual sense

- We Drop the First Welfare Theorem.
  - We assume complete markets
  - We drop complete participation in markets
  - This implies: the welfare theorems fail

- Central Banks (by using QE) fill in for missing insurance markets
The Economics of the Grim Reaper

Two Kinds of Macro Models

- **Representative Agent Models.**
  - Infinite commodity space
  - Finite number of infinite lived agents
  - With complete markets: the welfare theorems hold

- **Overlapping Generations Models.**
  - Infinite Commodity Space
  - Infinite number of finite lived agents
  - Even with complete markets: the welfare theorems fail

- **Two Failures of the Welfare Theorems**
  - Dynamic inefficiency
  - Incomplete participation
  - Incomplete participation is a big deal
The Hahn Problem
All Monetary Models Have Multiple Equilibria

- Infinite Horizon Models
  - Overlapping Generations Models (Samuelson)
  - RA models with MIUF (Brock)
  - RA models with active Taylor rule (Benhabib-et-al)

- Finite Horizon Models.
  - Money and Taxes (Starr)
  - We use this approach...
  - ... BUT ...

- What Selects an equilibrium?
  - Infinite regress (NK model)
  - FTPL (Sims-Cochrane-Woodford)
  - The Belief Function (Farmer)
Our Model

Three Private Agents: Two Periods

- Entrepreneur
  - Lives in period 2 only
  - Owns a technology
  - Hires workers and produces goods

- Workers
  - Two types
  - Live for two periods
  - Trade financial assets in period 1
  - Work and buy goods in period 2
Our Model
Two Public Agents (Conventional Monetary Policy)

- Treasury in Period 1
  - Borrow $ from public
  - Redistributes $ as lump-sum transfer to workers
- Treasury in Period 2
  - Taxes worker and entrepreneur to repay debt

- Central Bank in Period 1
  - Buys some $ denominated debt from Treasury
  - This creates money
- Central Bank in Period 2
  - Distributes $ seigniorage to Treasury
  - Allows debt to expire
  - This destroys money
Equilibrium

Equilibrium is Selected by Beliefs

- **Equilibrium**
  - Workers form beliefs in period 1 about the price level in period 2 & choose how much money to hold
  - Entrepreneurs do not hold money
  - Entrepreneurs real taxes depend on the price level

- **Optimistic Belief**
  - Price level is low
  - Real tax burden is high
  - Workers work hard (consume less leisure)

- **Pessimistic Belief**
  - Price level is high
  - Real tax burden is low
  - Workers work less (consume more leisure)
Do Sunspots Matter?
Cass-Shell JPE 1983

- **Lack of Insurance**
  - Entrepreneurs can’t trade assets
  - No fundamental uncertainty: BUT
  - Optimistic beliefs lead to high GDP and high profits
  - Pessimistic beliefs lead to low GDP and low profits

- **Complete Markets**
  - We allow workers to trade debt and equity
  - Equity completes the markets
  - This DOES NOT rule out sunspots: Why?
  - The unborn cannot participate in the asset markets
Do Sunspots Matter?
We Think So
Our Model with Uncertainty

The Asset Markets

- Three Assets
  - Workers buy and sell three assets...
  - ... money, bonds and equity
  - Entrepreneurs do not trade in the asset markets
  - Why? They are not yet born

- What Differentiates Assets
  - Money yields liquidity services
  - Bonds pay same in both states
  - Equity is a claim on profits of a firm

- Complete Markets
  - Workers can perfectly transfer income across states
  - Entrepreneurs cannot
  - The equilibrium is Pareto inefficient
Unconventional Monetary Policy

Composition of CB Balance Sheet Matters

- Quantitative and Qualitative Easing
  - Quantitative easing is an expansion of the CB balance sheet
  - Qualitative easing is a change in the composition of the CB balance sheet
  - Qualitative easing can replace missing markets

- CB Equity Trades
  - CB can buy or sell equity in exchange for debt
  - CB trades alter relative prices
  - By buying and selling equity CB can eliminate real effect of inefficient belief shocks

- What should CB/Treasury do?
  - The CB should equalize price of equity and price of an indexed bond
Summary

- All monetary models have multiple equilibria.
- Most of the fluctuations we see in asset markets are caused by shifts across these equilibria; aka animal spirits
- Central Banks and or National Treasuries Can and Should Aim to Stabilize Inefficient Asset Market Fluctuations through Countercyclical trades in the Asset Markets